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HISTORIC BUILDINGS AND THE LEAD PAINT HAZARD



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INTRODUCTION

In recent years, the hazards of lead-based paints have become an urgent public health issue. Thousands of children face irreversible mental and physical damage resulting from exposure to lead in their homes. Cognitively retarded adults are also adversely affected by lead poisoning. In 1971, in response to this threat, Federal legislation was established that required lead to be abated from certain surfaces in buildings. Massachusetts, in turn, passed legislation which has most recently been amended in January 1988, entitled *An Act Further Preventing Lead Poisoning*, and in 1989, the *Regulations for the Prevention and Control of Lead Poisoning* were added.

Current state legislation and regulations are in place to enhance earlier Federal legislation and to provide residents of Massachusetts with a process to reduce, or abate, a known health hazard--lead --from their buildings. In addition, the Massachusetts Childhood Lead Poisoning Prevention Program (CLPPP) has prepared a notification package that sellers or real estate brokers are legally required to distribute to prospective buyers; CLPPP also provides extensive information to the public about lead poisoning and the lead paint hazard.

The use of lead-based paint on buildings in Massachusetts began in the late seventeenth century and was a standard treatment until World War II, though lead continued to be used as an ingredient in some paints until 1978. *Therefore, virtually all historic Massachusetts properties that retain their early painted woodwork contain potentially hazardous levels of lead.*

Prior to proceeding with lead abatement, owners of historic properties should contact the Massachusetts Historical Commission, whose role is to encourage the use of the most appropriate and least destructive methods of paint removal, to offer technical assistance to homeowners, and to provide standards of work for lead abatement. Owners of properties listed on the State Register of Historic Places, upon receiving an order from a state agency to delead, are required to notify the Massachusetts Historical Commission before paint removal begins.

Choice of methods and choice of workers will determine the degree to which the historic features of a building will be protected or eroded as a result of the overall abatement plan. Appendix B describes paint removal methods that are prohibited in Massachusetts, and methods that are acceptable to use on historic buildings.

Who should be aware of the regulations mandated by An Act Further Preventing Lead Poisoning (M.G.L. c.111, ss190-199 and M.G.L. c.773) and the Regulations for the Prevention and Control of Lead Poisoning (105 CMR 460.000)?

- owners of historic properties listed on the State Register of Historic Places;
- owners of properties containing lead paint where children under six years reside;
- owners of properties where a child has been tested and found to have lead concentrations in blood exceeding state regulations;
- owners of properties with loose or flaking paint that may expose underlying lead-based layers; and
- potential buyers and sellers of historic properties.



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CHAPTER I

HOW CHILDREN ARE POISONED

There is no safe level of lead in the human body. The effects of lead poisoning, technically known as plumbism, are extremely diverse. In adults, lead may cause liver and kidney damage, reproductive and cardiac problems, and hypertension, but it is young children who are most directly threatened. Health problems can occur in a child before symptoms appear, and when symptoms do appear they can go unnoticed or be diagnosed incorrectly because they are so similar to flu.

Pediatricians in Massachusetts are now required to test children annually for lead poisoning. Generally, once lead poisoning has been determined, a state agency may request that the child be moved from the residence until lead paint has been abated according to regulations. In extreme cases, a medical procedure called chelation therapy may be initiated to help expel toxic levels of lead from the blood system, in addition to lead abatement of the residence.

Several causes of poisoning

- Any painted surface that is peeling, chipping, flaking, or otherwise failing will provide a constant source of small particles of paint. These conditions can be caused by thick build-ups of oil paint or other coatings on woodwork or plaster, by water penetration, or by poor building maintenance.
- Lead dust is a less visible but more potent hazard, as it may cause more harm than lead chips. This dust is difficult to remove, and may accumulate through the years. The constant hand to mouth behavior of small children causes them to ingest lead dust that may be in buildings, on toys, or on other painted objects. Windows are a source of lead dust in older buildings. The friction of opening and closing windows can generate lead dust, which can be easily touched and ingested by small children.
- *Two of the greatest generators of lead dust are renovation work and paint removal projects.* Homeowners considering undertaking lead-paint removal themselves should be aware that they may contaminate their environment or unwittingly poison themselves and their children. Unless meticulous masking and clean-up methods are used, it may be safer in some cases to leave intact paint layers undisturbed.
- Environmental hazards, such as lead in the soil of play areas and vegetable gardens, lead from unsafe water systems, or lead in paint on furniture may contribute to lead poisoning. Most experts conclude that, while these risks are real, the chief risk to children from lead is posed by architectural paints.

Surfaces that may pose a risk

Areas that require abatement because of the health risk presented by the generation of dangerous lead dust and chips include all surfaces with peeling or loose exterior and interior paint.

Additionally, if there are areas with defective paint in a room, or if a resident has elevated lead blood levels, specific surfaces that can be mouthed or chewed by young children must be abated. The regulations in Massachusetts define the areas in a building that are mouthable or chewable by children under six years of age. (Please see Appendix C, which presents an excerpt of Regulation 460.110.) These areas may include window and door casings, door edges, window sills, stair rails and the edges of risers, newel posts, balusters, mantels, and, in some cases, baseboards and wainscots.

The regulations also cite exterior and interior movable windows as a source of lead dust and chips, and require them to be abated in their entirety. Generally, abatement is required on painted surfaces that are less than five feet from the floor or ground, protrude more than one-half inch from the surface, or are less than four inches from corners and edges.

CHAPTER II

TESTING FOR LEAD IN PAINTED SURFACES

Owners of historic buildings may wish to determine with certainty whether paint contains dangerous levels of lead. If a child six years of age or under resides in a unit or house, the law mandates that the homeowner must have the paints tested by a licensed inspector. This inspection may also be triggered by elevated blood lead levels.

Two processes are used to test for lead on site: applying sodium sulfide to the painted surface, or using a mobile X-ray fluorescence analyzer (used regularly by city, state, and private inspectors but not readily available to homeowners). Otherwise, a sample must be sent to a commercial laboratory.

There are advantages and disadvantages to each of these alternatives:

- 1) a spot chemical test (8% sodium sulfide solution)

advantages

- easy to use
- readily available in kits from many paint stores
- results are easily visible: paint that darkens usually contains lead

disadvantages

- cannot quantify the amounts of lead present
- cannot be used on dark colors where color changes may be imperceptible
- false readings can sometimes occur
- has a limited shelf life

- 2) a mobile X-ray fluorescence analyzer

advantages

- gives digital readouts quickly
- readouts are quite accurate
- gives lead measurements per unit area

disadvantages

- seldom available to individuals due to their cost
- cannot be used in inaccessible places
- cannot measure levels of lead dust

- 3) sending samples for testing and quantification to a commercial analytical laboratory (ask for instruction on the taking and sending of samples)

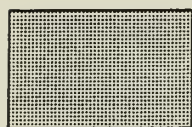
advantages

- gives the most accurate results
- can give percentage lead by weight
- can verify other methods

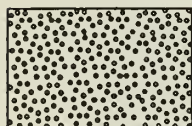
disadvantages

- laboratory work is sometimes expensive
- results may not be available immediately

KEY TO ABATEMENT AREAS

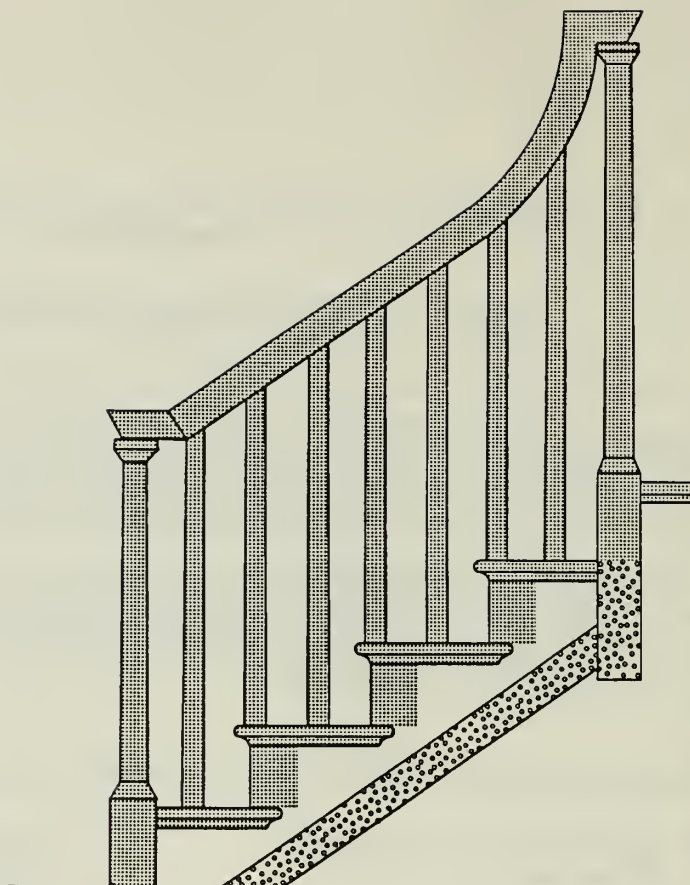


requires abatement

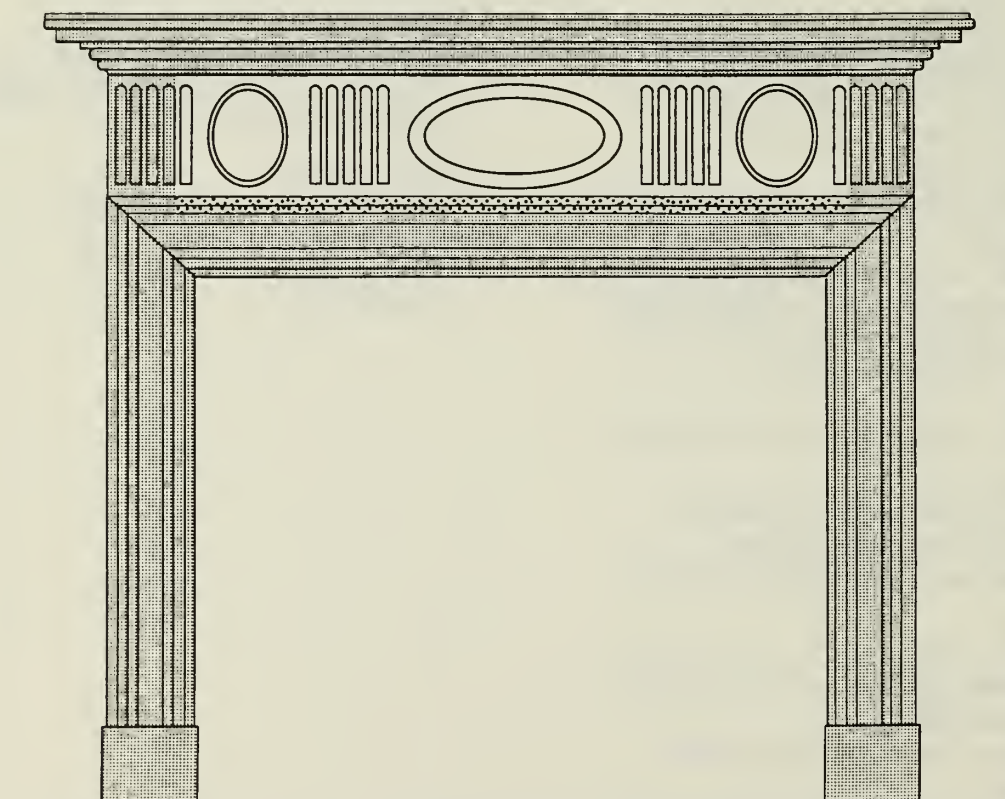


may require abatement,
depending upon
projection and edge

If stairs have lead paint, most of
their elements require abatement.
Areas of intact paint may remain on
the stair skirt.



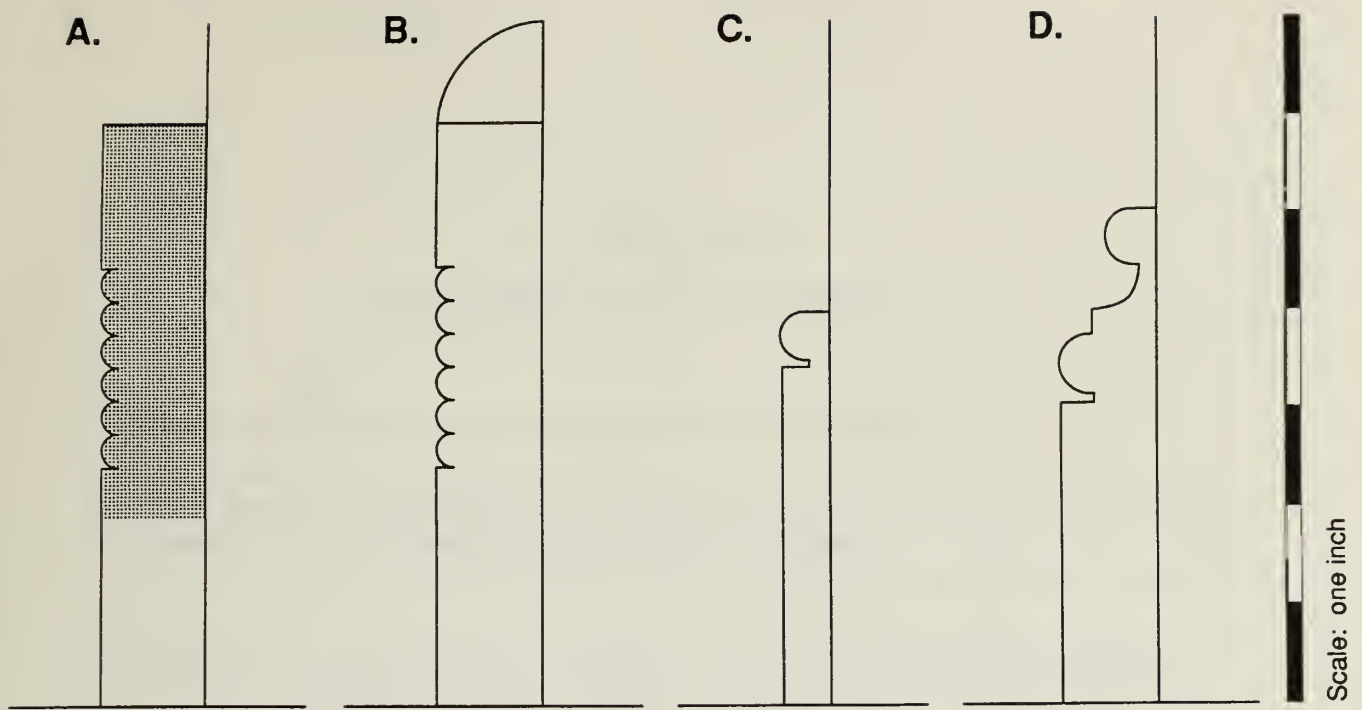
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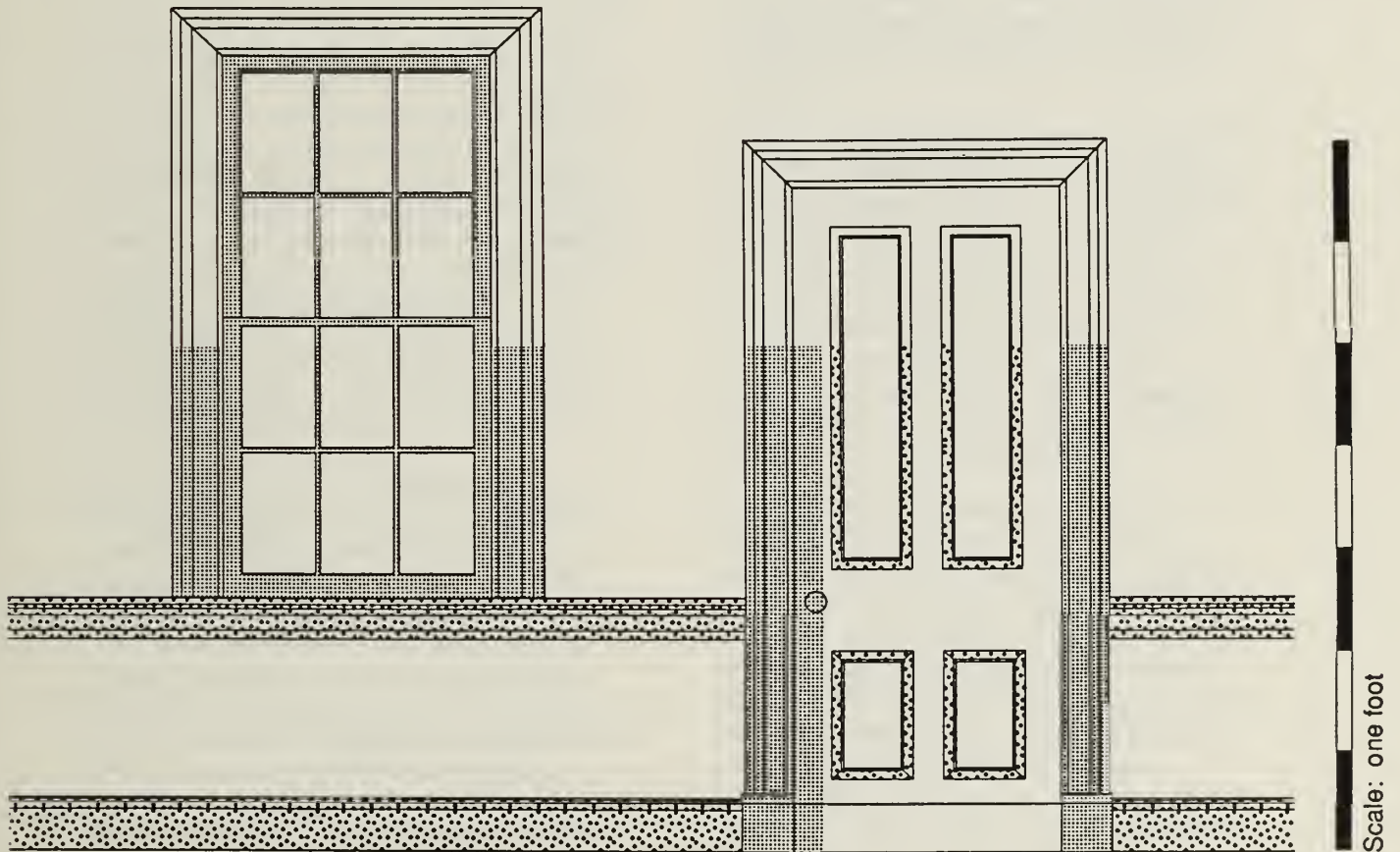
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Mantels require abatement along edges and protruding mantel shelf. Mantels particularly
should be examined for evidence of decorative painting before abatement.

(Drawings adapted from Asher Benjamin by James Kyprianos)



Baseboard profiles. Baseboard A projects more than one-half inch and has a sharp corner and edge—it must be abated. With the addition of a quarter-round molding (Baseboard B), it does not require abatement. Baseboards C and D do not need to be abated because they have no sharp “chewable” edges.



Door and window frames, door edges, and outside corners must be abated to the five-foot level. Movable window sash and adjacent woodwork must be entirely abated. Baseboards and chair rails may or may not need to be abated depending upon their projection, edges, and corners. Intact paint on floors, wainscots, walls and ceilings may remain in place.

(Drawings adapted from Asher Benjamin by James Kyprianos)

CHAPTER III

PRELIMINARY CONSIDERATIONS

Extensive paint removal can adversely affect historic buildings through:

- outright loss of historic features from paint removal;
- surface damage to wood, plaster, or other materials from inappropriate paint removal methods or poor craftsmanship during paint removal; and
- loss of paint layers, which may offer valuable information about a building's history.

Generally, it is important to remove paint rather than replace architectural features. As a rule of thumb, when using any of the following abatement methods, the substrate should be kept as intact as possible. Plaster surfaces should not be marred, and wooden moldings and carvings should retain their original profiles.

A. Loss of a building's history

Paint layers represent a building's history in each period since construction. In recent years, there has been much interest in the study and replication of original or early interior and exterior paints; however, authentic colors can only be ascertained from complete samples of paint layers. During paint research, it is often necessary to locate thick drips trapped in cracks or obscure spots to determine the original color of paints mixed with unstable pigments. Lead paint abatement, because it is so thorough, could remove all this evidence and thus inadvertently erase a building's history.

Painted decorative treatments, once thought to have been only occasionally used in buildings, were actually very common. Painted wood graining was a technique used from colonial times into the twentieth century and is frequently found on doors, which were painted to resemble more expensive or fashionable wood. Mantles, baseboards, and paneled walls were often painted to replicate marble--a technique called marbleizing. In New England, itinerant artists provided homeowners with stenciling, freehand

designs, and murals. Later, in the Victorian period, houses routinely had elaborately painted decorations on walls and ceilings.

Owners of historic buildings will find that paint layers can be useful when dating architectural features or researching the alterations that have occurred in a building. For example, studying the number and colors of paint layers on a baseboard and an adjacent mantel may reveal that one was a later addition, while, in another case, molding profiles of an earlier but missing element can be found preserved in a paint layer.

Prior to lead abatement, it is recommended to investigate for evidence of decorative painting, and, if any is found, to protect representative examples. Areas can be saved by stripping paint only to the required five-foot level on door edges or window and door casings, or by removing lead paint only from the required protruding areas on mantels, baseboards, or wainscots. Leaving intact layers on upper areas of woodwork or on flat surfaces of lower areas will greatly

benefit any future study; full paint layering sequences are necessary for a complete understanding of a building and its history.

Analysis of nails is another useful method to date historic buildings. If architectural elements are removed temporarily for lead abatement, this evidence can be lost. To conserve nail evidence and to prevent the surface splintering that can occur when nails are hammered out, nails should be cut from behind with side cutters and each element returned to its exact former location.

B. Choosing deleading contractors

Deleading contractors are required to be registered, trained, and certified by the Department of Labor and Industry, and to comply with the lead abatement procedures as stated in the regulations. Owners of historic buildings should be familiar with the risks and advantages of a variety of paint removal methods, and should find a contractor who will use a chosen method skillfully and to the satisfaction of both the homeowner and state agencies. In general, it is recommended that the homeowner hire a contractor who will use the highest standards of

craftsmanship, and who will avoid the removal of historic elements.

- Contact several contractors registered with the Department of Labor and Industry;
- Ask for references; and
- See completed jobs and speak with former clients.

C. Not all elements require abatement

In most cases, not all paint has to be stripped; the regulations allow paint to remain on certain surfaces. Floors, non-protruding wainscots, and most baseboards with intact, nonflaking paint may not require abatement. Intact surfaces on upper members of window or door frames or ceilings may also keep their paint layers. Columns can usually remain unstripped. Homeowners should be familiar enough with the regulations to know which areas can or cannot keep their early paints.

Covering specific areas, described below as encapsulation, is another alternative. In altering any portion of an historic building, the guidelines set forth in The Secretary of the Interior's Standards for Rehabilitation should be followed (see Appendix D).

CHAPTER IV

COMPARISONS OF REMOVAL METHODS

At present there are three categories of paint removal: *Mechanical*, *Heat*, and *Chemical*, and two additional approaches under the broader heading of abatement: *Encapsulation* and *Replacement*. *Choice of methods, choice of workers, and the overall plan will determine the degree to which the historic features of a building will be protected or damaged.*

A. Mechanical methods

Mechanical methods share two major disadvantages: the production of dangerous residues, and the possibility of damaging the wood (or other) substrate.

1. Scraping:

Traditional scraping is a very slow process that can remove lead coatings completely only with great effort. Wooden surfaces and molding profiles are often gouged irreparably. In general, scraping is recommended for interior removal on completely flat surfaces *only*. Removal using this method can be time-consuming and costly.

2. Sanding:

Sanding is the greatest producer of dangerous lead dust. The two methods most commonly used are palm sanding and rotary, or disc, sanding. Palm sanding is time-consuming, and may damage wooden molding profiles and carved work if not done with the greatest skill and care. Rotary sanders can leave noticeable disc scars on flat surfaces, and can destroy carved work and molding profiles altogether. Mechanical sanding with an orbital sander can produce acceptable results, but it should be used only as a finishing or smoothing tool, while belt sanders should be limited to flat surfaces.

To control dangerous lead dust, it is recommended that HEPA (High Efficiency Particulate Air) equipped sanders that collect dust and residue instantly be used, but only on flat surfaces, not carved or molded, ones.

3. Grit or water blasting:

It is recommended that homeowners avoid any blasting on wood, plaster, or brick surfaces, though it may be acceptable on metals. In addition to marring or pitting surfaces and damaging architectural details, it is extremely difficult to control dangerous lead particles and chips from escaping into the environment during blasting.

B. Heat methods

Fire is a risk with all heat-removal techniques, and fire extinguishers should always be kept nearby. These methods have both health and safety risks, and may scorch wood or break glass. Further, they often leave a residue on the wood surface and must be followed by another technique before a lead-free surface is obtained. However, skillful use of a low-risk heat technique can produce acceptable results on flat, molded, or even carved historic features. Although they release fewer harmful lead compounds than mechanical methods, these

paint removal methods require workers to wear protective clothing and proper respirators.

1. Torch:

Removal by torch is dangerous and never acceptable on an historic building. In addition to the risk to workers from the flames and airborne lead compounds, torches cause fires easily.

2. Heating coils and hot air guns:

These techniques can be effective abatement techniques in some cases, but entail the risk of fire. Ideally, only a controlled, low-level heating element which produces a temperature not exceeding 1,000 degrees Fahrenheit should be considered for paint removal. Heating elements can successfully soften paint for removal with hand tools.

3. Superheated steam:

A new heat-type removal system based on superheated steam may be available in the future. Steam, heated to extremely high temperatures, softens the paint layers just as in the other heat-based systems, but reduces the risk of fire to low levels.

C. Chemical methods

1. On site:

There are two principal chemical paint removal systems: solvent-based and caustic. Deleading contractors are limited to using caustics on-site. Although solvent-based removers offer satisfactory results on historic interiors, Massachusetts prohibits licensed deleaders from using methylene chloride (solvent-based) strippers except in off-site dipping facilities approved by the Department of Labor and Industry, because of concerns for worker health and safety due to its toxicity.

Caution is recommended when applying caustic paint removers to wood. While not carcinogenic or as toxic as solvent-based strippers, caustic paint removers have been known to pit wood surfaces

and raise wood grain. If any of their alkalis remain in the wood, they may cause future paint failure. In addition, the combination of caustics and scraping tools may produce a less-than-satisfactory appearance.

2. Off-site dipping:

An alternative chemical method is to have elements removed from a building and taken to a commercial stripping business, where they are immersed in tanks of chemical remover, scrubbed down, and returned. This method will not create the dust or fumes which can be a problem during abatement. The success of off-site dipping depends upon the quality of the shop doing the work, the chemicals used, and how often they are changed. Dimensions of their tanks should allow architectural elements to be submerged.

- **Removing elements from the building:** When abating an architectural element by off-site dipping, it is recommended that elements be removed carefully without damaging the surrounding wood or plaster. Historic nails should remain in place. All removable elements should be marked, noting date of paint removal, so that they can be returned to their proper location. Notations scratched directly into the back of the pieces will survive the dipping process, will aid in the proper reassembly of the woodwork, and will serve as markers during any future study of the building.

Doors, window sash, door and window frames and casings, chair rails, stair rails, and balusters can usually be removed if done with care. Mopboards, wainscots, and large areas of raised field paneling may be more problematic. The desire for off-site removal should be weighed with the difficulty of disassembly, transport, and reinstallation. The best solution may be a combination of removal for off-site abatement of smaller items and on-site abatement of larger or more complex elements.

- Two types of dip tanks are commonly used:

- a. The "cold tank" contains solvent-based (methylene chloride) strippers and is the safer of the two, showing less tendency to raise the grain of the wood or to dissolve the glues that may be found in doors or window sash. Further, the active ingredients evaporate, leaving no residue to cause future problems. Dipping historic woodwork should be confined to the cold tank.

- b. The "hot tank" is less expensive, but it contains caustics, which require careful attention during the dipping process. Because caustics have been known to loosen glues, the "dwell-time," or length of time the object is immersed in caustics, is crucial. All architectural elements should be washed thoroughly after dipping to avoid problems of residual alkalis and their salts, which can cause future paint failure, and then sanded lightly to remove any raised grain.

D. Encapsulation

It is possible to protect children from lead-paint hazards without paint removal by covering or "encapsulating" the painted surfaces either permanently or temporarily, until a time when children under six years of age no longer reside in the building. This method is specifically listed as an option in the Massachusetts regulations. A mantel with original marbleizing, for example, could keep its valuable paint layers in this manner.

Acceptable encapsulation requires that durable materials (wallboard, fiberglass sheets, sheet metal, or vinyl wall coverings) be securely affixed to a height five feet above the floor. It is important that

historic elements are not damaged by encapsulation. Avoid potentially damaging methods of attachment, such as non-soluble adhesives. *Conventional wallpaper or further paint layers do not constitute proper encapsulation.*

Encapsulation adds material rather than removing it, permitting architectural elements to be saved and all early evidence to remain undisturbed. Although encapsulation obscures period features, it is usually reversible and is therefore an attractive choice in cases where economic considerations might otherwise dictate removal and replacement of elements.

Vinyl siding, while technically acceptable as an exterior encapsulating material, is not a recommended treatment for historic buildings. The use of vinyl siding often requires the removal of architectural elements and decorative treatments. In addition, it diminishes a building's clarity by obscuring architectural features and important visual characteristics.

E. Replacement - Permanent or Temporary?

Permanent replacement of any architectural feature should be avoided in historic buildings. If there is no alternative except replacement of historical building parts, it is recommended that a representative example of each element be photographed in place, then indelibly marked with a description of its former location and stored on the property in a place inaccessible to young children. Alternatively, all of the removed elements can be labeled, temporarily stored, and reinstalled when children have grown or no longer reside in the building.

CHAPTER V

MASKING

The danger and difficulty associated with lead abatement requires that the masking, abatement, and clean-up work be performed by a trained certified contractor. The success of any abatement from a health standpoint will be determined largely by the effectiveness of the initial masking of the area and the following clean-up. The work must be conducted in a manner that will leave the environment lead-free and ensure the health of the workers and residents. In Massachusetts, all residents must move out prior to abatement and must get a reoccupancy inspection from the code enforcement agency or licensed private inspector before returning.

A. Interior spaces

Two concepts are important:

- isolation of the target room from the rest of the building, and
- effective masking within the room.

Owners of historic properties are encouraged to spot-check the work in progress to ensure that rooms are well-masked and abatement is proceeding without damage to the substrates. Protective clothing and respirators must be worn on site as specified in the regulations.

B. Exterior abatement

It is extremely difficult to contain hazardous lead dust during abatement and final cleaning of exterior surfaces. It is

important to prevent penetration of lead residues into the surrounding soil and scattering of dangerous lead dust into the environment. If not done with extreme caution, exterior paint removal can endanger children who play nearby and preclude vegetable gardening in that area.

Until more specific safety guidelines are established, overlapping layers of polyethylene should cover the adjacent ground completely and be attached securely to the building to catch all residue. Children, pregnant women, and pets should be kept away, and all windows in the building, or any adjacent building, should be kept closed. Never proceed with exterior paint removal on windy days.

CHAPTER VI

CLEAN-UP

Specific procedures in the regulations have been developed to minimize residual dust after abatement. Final clean-up must be executed by the deleading contractor and consist of:

- HEPA (High Efficiency Particulate Air) vacuuming,
- followed by wet mopping/sponging with tri-sodium phosphate (TSP).

A. Interior

Each room must be cleaned from ceiling to floor by at least two passes of vacuuming and washing. New batches of TSP should be mixed often to avoid re-depositing lead particles. Only a HEPA vacuum should be used to collect hazardous lead dust; household vacuums are prohibited. All residues and contaminated material should be disposed of properly by the deleading contractor in compliance with regulations. After reinspection by a licensed inspector, abated surfaces should be recoated with

new nonlead paint or varnish before residents return to the building.

B. Exterior

Exterior clean-up should follow regulations explicitly because toxic lead dust and chips can easily escape into the environment. Abated surfaces must receive at least two passes of both HEPA vacuuming and wet mopping or sponging with TSP. In addition, deleading contractors are required to decontaminate or dispose of all supplies and materials used during the abatement process in accordance with the regulations.

CHAPTER VII

CONCLUSION

The issue of lead abatement may present a number of problems for owners of historic buildings. Each historic building is unique. Any damage caused by unskilled workers or poorly chosen methods of paint removal will be permanent. Loss of a building's architectural features, damage to wood and plaster, and loss of early paint layers or decorative paints due to poorly chosen abatement methods are serious issues that should be anticipated prior to lead abatement. Unfortunately, the cheapest methods of paint removal are not the most appropriate to historic buildings, which need special, sensitive treatment.

There are paint removal methods, requiring skill on the part of the worker, that remove paint without damaging historic surfaces. It is also possible to contain lead dust and chips if careful masking, clean-up, and disposal procedures are used. The Massachusetts Historical Commission hopes to provide owners of historic buildings with the technical assistance and resources necessary to find creative, careful, and safe solutions for lead paint removal. It is of great importance to provide a lead-free environment for young children and to preserve the tradition of older buildings in Massachusetts.

For more information about lead abatement on historic buildings or for information about other abatement projects on historic buildings in Massachusetts, contact the Massachusetts Historical Commission.

Appendix A

GLOSSARY

Abatement - The reduction of lead hazards by any of a number of means.

Chelation - A medical procedure to treat lead poisoning. Taken orally or by injection, it neutralizes the toxicity of lead in the blood system.

Chewable surfaces - Any feature of a building that is less than five feet from the floor or ground, has corners or edges, and projects more than one-half inch from an interior or exterior surface so that it can be mouthed by a small child.

Elevated blood lead (EBL) - The lead content of a poisoned individual's blood. Present government standards now consider any level above 25 ug/dl to be elevated.

HEPA - High Efficiency Particulate Air

filtering vacuum; a specialized vacuum used for eliminating lead dust. HEPA sanders are also based on the same system.

Plumbism - The medical name for lead poisoning. References to clinical plumbism (acute, symptomatic poisoning) and sub-clinical plumbism (asymptomatic poisoning) are found.

Substrate - The material on which paint or varnish layers are applied, usually wood, plaster, or metal.

ug/dl - Micrograms per deciliter. The measure used to indicate the amount of lead in a person's blood.

X-ray Fluorescent Analyzer (XRF) - A device used to measure the lead content of a given layering of finishes.

Appendix B

Excerpts from the Massachusetts Regulations for the Prevention and Control of Lead Poisoning - 105 CMR 460.120: Methods of Removal (D) and (E):

Paint Removal Methods Prohibited in Massachusetts:

1. Torch or flame burning.
2. Dry abrasive blasting using sand, grit or any other particulate.
3. Use of potassium or sodium hydroxide based solutions and/or methylene chloride.
4. Machine sanding.

Suggested paint removal methods for historic buildings:

For properties listed on the State Register of Historic Places, the following methods, usually in combination, may be appropriate depending on the substrate and its condition. Any method can cause damage if used improperly. Testing of products and strict controls on workmanship are recommended.

1. Softening paint with heat guns, heat plates, or steam.

2. Stripping with solvent-based noncaustic chemical solutions.

3. Scraping, without gouging woodwork.

4. Sanding, by hand.

5. Mechanical sanding with orbital sander with HEPA attachment, only as a finishing or smoothing tool.

6. Mechanical sanding with belt sander with HEPA attachment, only on a flat surface and by a skilled operator.

7. Abrasive blasting with sand, other gritty substances, and/or water when used with a wet misting technique or simultaneous vacuuming system, only in the following situations:

- a. Industrial interior masonry or wood surfaces without significant design, detailing, tooling, or finish.
- b. Cast and wrought iron and steel.
- c. Concrete.
- d. Delicate abrasive cleaning supervised by an architectural conservator.

Appendix C

Excerpt from the Massachusetts Regulations for the Prevention and Control of Lead Poisoning - 105 CMR 460.110: Lead Violations - Methods of Compliance (B)

Areas in buildings that require lead abatement:

(460.110) - Pursuant to s. 197, removal...must be performed as follows.

1. All peeling or loose paint, plaster, putty, or other material on both interior and exterior surfaces and fixtures shall be removed or adequately covered.

2. Windows with sills five feet or less from the floor or ground must have all lead paint and putty removed from all surfaces that are either movable or that come in contact with movable surfaces. Surfaces include interior and exterior

sashes, sills in their entirety, mullions, and parting beads.

3. Intact paint, plaster, putty or other leaded material shall be removed or covered on accessible, chewable surfaces, both freestanding and those that protrude one-half inch or more, below five feet and four inches from all edges. Architectural elements and surfaces to be treated include: doors; door frames; the face of window casings; stair rails and stair rail spindles, stair treads from the tread to the lip and to the riser below; porch railings; and all other exterior and interior surfaces or fixtures that may be chewed readily by children.

Appendix D

THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION

Any alteration of an historic building, including abatement of lead-based paints, should follow the guidelines set forth in The Secretary of the Interior's Standards for Rehabilitation. They are as follows:

- 1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.*
- 2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.*
- 3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.*
- 4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.*
- 5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.*
- 6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.*
- 7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.*
- 8. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.*
- 9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.*
- 10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

Appendix E

REFERENCES

Copies of the Lead Law (M.G.L.c.111, ss.190-199 and M.G.L.c.773) and Regulations for the Prevention and Control of Lead Poisoning (105 CMR 460.000) can be obtained from the State House Bookstore, State House, Boston, MA 02133 (617) 727-2834.

For information about lead poisoning or requests for a list of registered private lead paint inspection companies, contact the Childhood Lead Poisoning Prevention Program (CLPPP), 305 South Street, Jamaica Plain, MA 02130 (617) 522-3700.

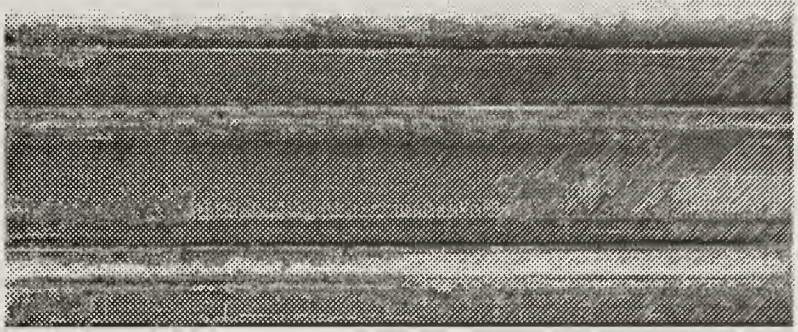
For a list of certified deleading contractors, contact the Department of Labor and Industry, Room 1101, Saltonstall Building, 100 Cambridge Street, Boston, MA 02202 (617) 727-1932.

Copies of The Secretary of the Interior's Standards for Rehabilitation can be obtained from the National Park Service, 15 State Street, Boston, MA 02109 (617) 223-3778.

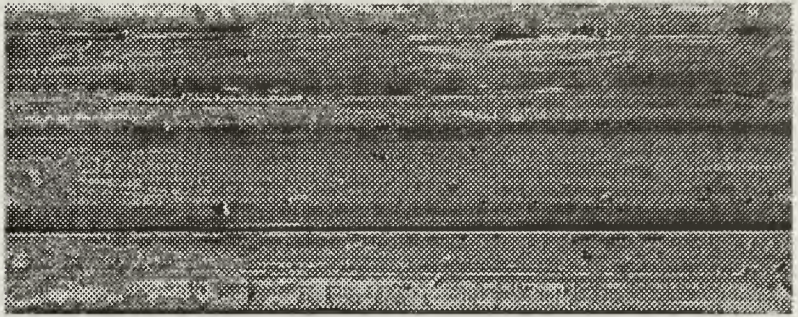
Questions concerning abatement on historic properties should be directed to the Massachusetts Historical Commission, 80 Boylston Street, Boston, MA 02116 (617) 727-8470.

Comparisons of paint removal methods

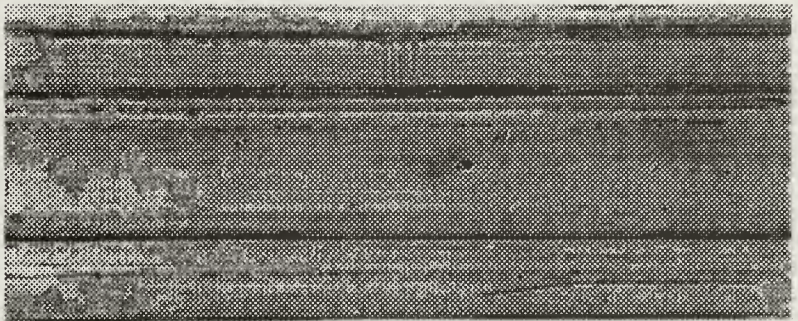
Successful paint removal is possible if the methods are carefully chosen and executed skillfully.



Metal tools can gouge and damage wood.



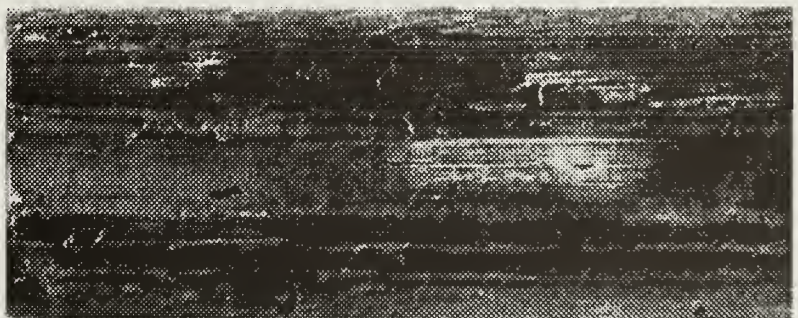
Sometimes careless work will alter, redraw, and even add lines.



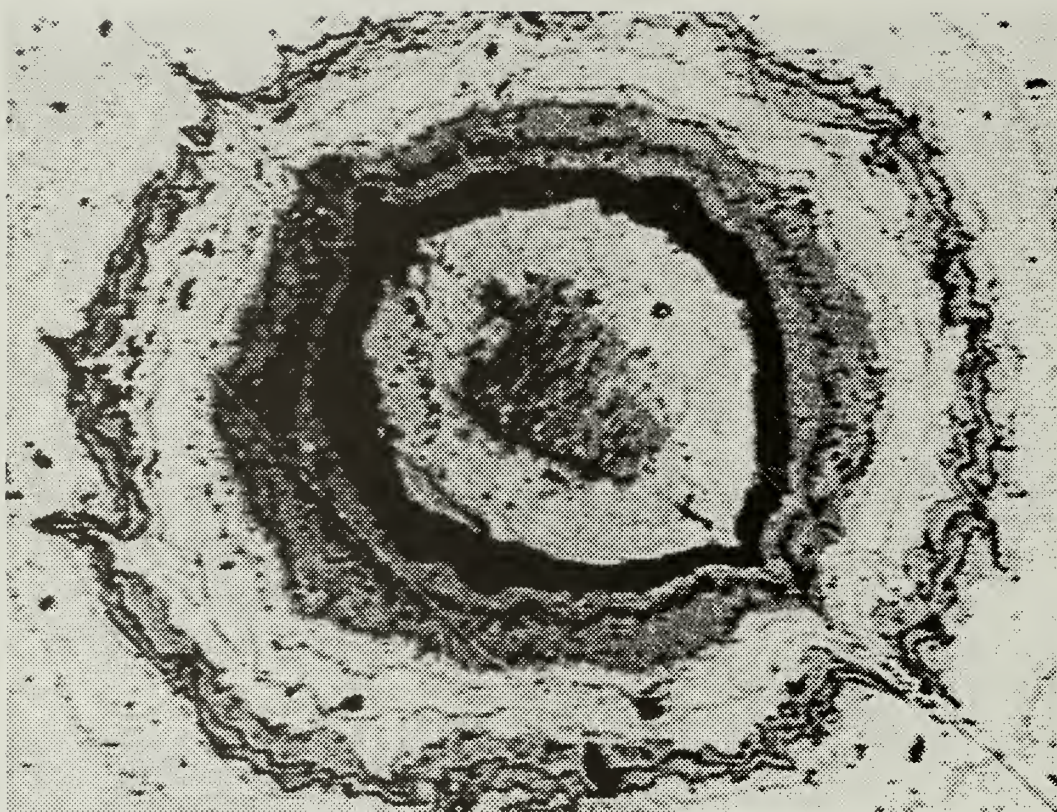
Heat methods can scorch wood if their temperature is too high, or if they are held on the surface too long.



Wood surfaces can be destroyed by caustic chemicals if left too long in the "hot tank" during off-site dipping.

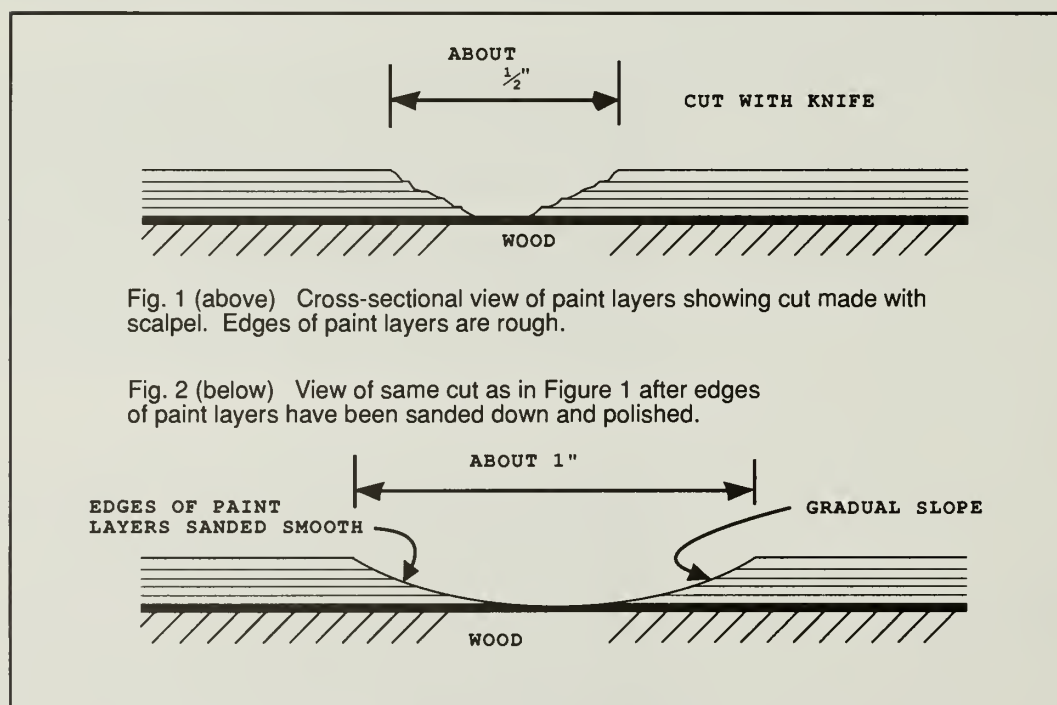


(Photos: J. David Bohl)



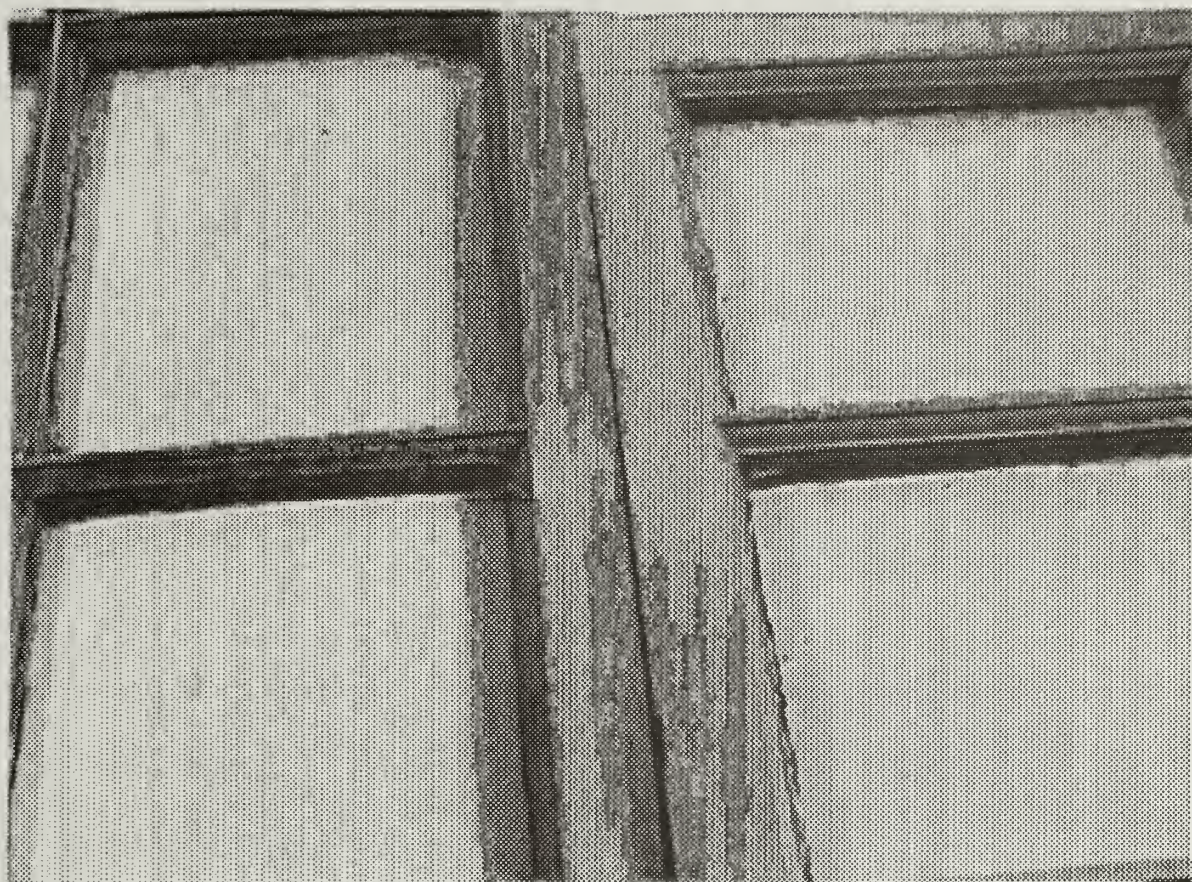
Cratering, viewed through a microscope, is a method used by architectural conservators to research paint layers. Typically, painted woodwork in older buildings has many coats,

one on another. The history of a room's colors is hidden within these layers. (Photo: Courtesy of the Association for Preservation Technology)



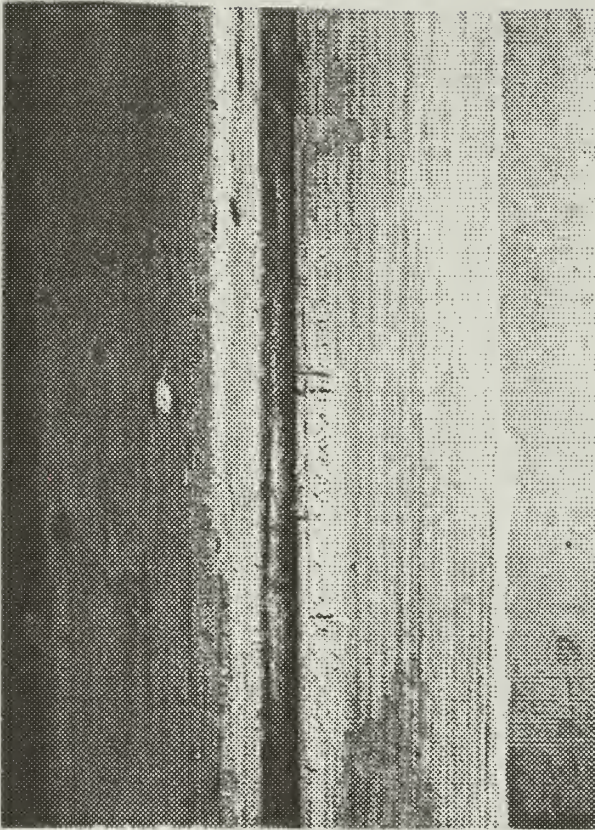
A documentary record of paint layers can be determined by professional paint research.

(Photo: Courtesy of the Association for Preservation Technology)



This photograph shows two window sash from the same window opening. The sash on the left was movable, and required lead abatement. The sash on the right did not require abatement because it was "fixed," or unmovable, and, in addition, its

paint layers were not peeling or flaking. The paint removal method used on the left-hand window was sanding, which smoothed its beading and molding profile until they were nearly destroyed. (Photo: Leslie Fox)



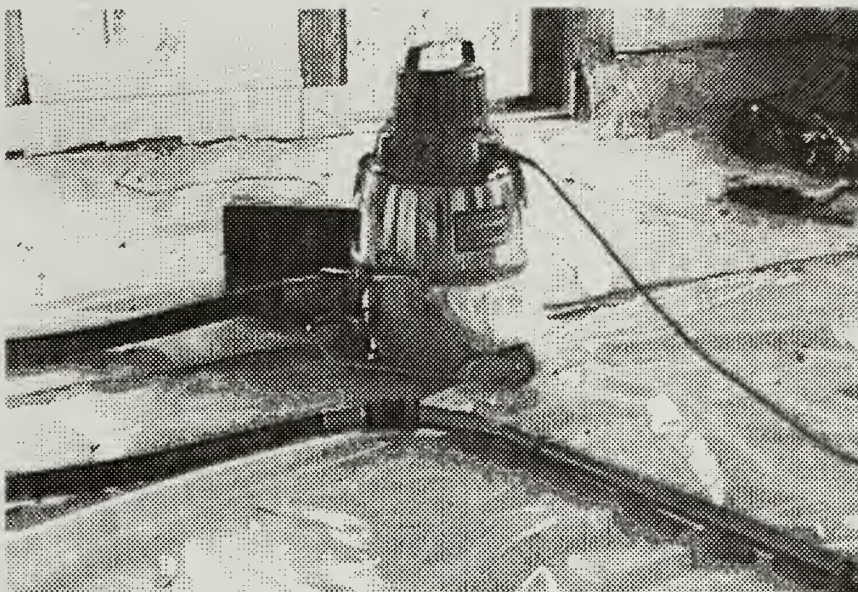
The door edge and casing show scarring and gouging from a combination of caustic chemical remover and scraping. Before repainting, sanding will be necessary. This will remove even more of the wood surface. A different paint removal method, more skillfully executed, would have left the woodwork intact.

(Photo: Paul Holtz)



Window sash can be gouged beyond repair by scraping with hand tools.

(Photo: Paul Holtz)



HEPA (High Efficiency Particulate Air) vacuums are essential for clean-up because they instantly collect lead dust. Note the careful masking using several layers of polyethelene. Baseboards in

this room did not require abatement because they projected less than one-half inch. The window frames did require abatement. (Photo: Leslie Fox)



On the first floor level of the Sherborn Old Town Hall, the door frame and the corner wood blocks (quoins) were abated to a height five feet above the ground. Licensed deleading contractors used protective clothing and respirators as required. The front entry was carefully masked with layers of polyethelene. (Photo: Pat Cassell)

